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Do Universities Benefit Local Youth? Evidence from University and College Participation, and Graduate Earnings Following the Creation of a New University

by Marc Frenette

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Abstract

In this study, I explore the relationship between the presence of a local university and university and college participation, and graduate earnings among local youth. The evidence is drawn from census data, along with information on the creation of new degree-granting institutions in Canada. Students who do not have access to a local university are far less likely to go on to university than students who grew up near a university, likely because of the added cost of moving away to attend, as opposed to differences in other factors (e.g., family income, parental education, academic achievement). When distant students are faced with a local option, however, their probability of attendance substantially increases. Specifically, the creation of a local degree-granting institution is associated with a 28.1% increase in university attendance among local youth, and large increases were registered in each city affected. However, the increase in university participation came at the expense of college participation in most cities. Furthermore, not everyone benefited equally from new universities. In particular, students from lower-income families saw the largest increase in university participation, which is consistent with the notion that distance poses a financial barrier. Also, local Aboriginal youth only saw a slight increase in university participation when faced with a local university option. Finally, the presence of a local university is associated with a 9.5% increase in earnings among recent female postsecondary graduates; however, it is not associated with a change in earnings among recent male postsecondary graduates.

Keywords: university participation, distance to school, university infrastructure.

Executive summary

Previous research suggests that distance to school acts as a barrier to university access. Students from lower income families are particularly sensitive to increased distance, likely because of the added cost associated with having to move away from the home to attend university. One way to bridge this distance gap is to offer university programs in outlying areas, either by building a new university or by offering a wide variety of university programs in an existing college.

The goal of this study is to assess the impact of these new universities on the postsecondary participation and graduate earnings of youth who grew up in the area. The study uses census data from 1981 to 2001 to examine 20 to 24 year-old individuals who, five years earlier, lived in a city that either had a university or did not.

The study finds that the creation of a local degree granting institution is associated with a 28.1% increase in university attendance among youth who grew up in that area. Large increases were registered in each affected city. Students from lower income families saw the largest increase in university participation, likely because pursuing a university degree became more affordable once a local option became available. University participation among local Aboriginal youth, on the other hand, was the same whether a university was available locally or not.

The increase in university participation that was registered among the broad population of youth came at the expense of college participation. Overall, total postsecondary participation only rose moderately as a result of the creation of these new universities. Nevertheless, annual earnings among postsecondary graduates who grew up in the area increased following the creation of the new universities, albeit only for women. Specifically, the presence of a local university is associated with a 9.5% increase in earnings among recent female postsecondary graduates. Among recent male postsecondary graduates, earnings were similar whether a university was available locally or not.

1. Introduction

"If you build it, he will come."

The Mystery Voice in Field of Dreams (Universal City Studios, 1989)

Access to a university education is important for many reasons, not the least of which is the ability to compete in the knowledge-based economy, as well as for equity of economic opportunities. With the rise in undergraduate tuition fees in recent years, there have been increasing concerns that qualified students may be denied the opportunity to pursue higher studies. Research on university access usually focuses on students from disadvantaged backgrounds (Corak et al., 2003; Coelli, 2005; Drolet, 2005; and Frenette, 2005). Interestingly, Frenette (2005) finds that students who come from families in the bottom quartile of the income distribution are just as likely to go on to university as students from the second-bottom quartile. Furthermore, the same study suggests that Canadian students enjoy much more equity in university access than American students across the income distribution.

Another form of financial constraint is one's geographic distance to school: students who live far away from a university must leave home in order to attend, which can be quite costly. Recent estimates by Barr-Telford et al. (2003) place the additional cost of moving away to attend university at $5,400 per year,[1] which actually surpasses the costs associated with tuition, other school fees, books, and supplies (about $3,700 per year). Given these numbers, it is not surprising that students who grew up in an area that is not within commuting distance to a university are far less likely to attend shortly after high school (Andres and Looker, 2001; Frenette, 2004 and 2006).

An important question remains unanswered in the distance-to-school literature: "How can policymakers bridge the distance gap?" Two alternatives include covering the additional costs to help distant students attend (through loans or grants) or increasing capacity in outlying areas. In other words, do we bring the students to the school or do we bring the school to the students? From a policy perspective, the distinction between the two is very important since they have very different implications for regional differences in economic prosperity. If students are enticed to leave their home town to pursue a university education in larger centers through financial aid, there is no guarantee that they would return to work in their home town: social and professional networks that were established in university may make it costly to return. Increasing university infrastructure in outlying areas may have the opposite effect: if students can pursue a university education without leaving the home, the local networks they began establishing in high school may be further solidified in university, or new local networks could be established in university. Furthermore, some students who attend the new university from out of town may decide to stay.

This study is primarily concerned with the latter of these two possibilities. Specifically, I attempt to assess the impact of creating new universities on the university and college attendance rate among local youth. Whether local universities raise attendance rates among local youth or not is an open

1. This includes the cost of food, accommodation, utilities, and other non-educational expenses. Of course, some of these expenses might have been incurred had the student stayed with his or her parents, but likely at a lower cost.

question. Clearly, if distance to school is truly a deterrent to attending, then the presence of a local university is likely to help. However, there is a possibility that a school built in a remote area might become a second choice for students who did not qualify for entrance into universities in larger centres. Some of these students may not be deterred by having to move away from home to attend if the alternative is to not attend at all, and may thus crowd out local students.

I begin by reviewing the existing evidence on the short-term educational outcomes of students classified by the distance separating their home during high school and the nearest university. As noted above, increased distance to school has been negatively linked to university enrolment. Although factors such as family income and parental education have been taken into account, the distance–participation association may reflect ability differences. Specifically, it may be argued that geographic selection on the part of the parents may be related to their abilities (and possibly that of their children). If distance to school simply picks up the variation in these differences in abilities, then the creation of a local university is not likely to bridge the distance gap. If, however, distance to school is not related to abilities, then increasing capacity in outlying areas may potentially bridge the distance gap. Therefore, it is imperative to establish the relationship between distance to school and academic achievement prior to assessing the impact of a local university on local attendance.

I attempt to establish this relationship by examining standardized test scores in reading, mathematics, and science among a sample of 15-year-olds classified by the distance separating their school and the nearest university. This exercise reveals that there exists virtually no academic disadvantage associated with growing up far away from a university (generally about 2%). In relative terms, this gap in academic achievement is much smaller than the gaps in university participation found by Andres and Looker (2001) and Frenette (2004 and 2006). In other words, students who grew up far away from a university are less likely to attend for reasons other than parental finances, role modelling effects (through parental education), and academic achievement. The cost of moving away to attend is a more plausible reason. This suggests that the creation of a local university may potentially bridge the distance gap.

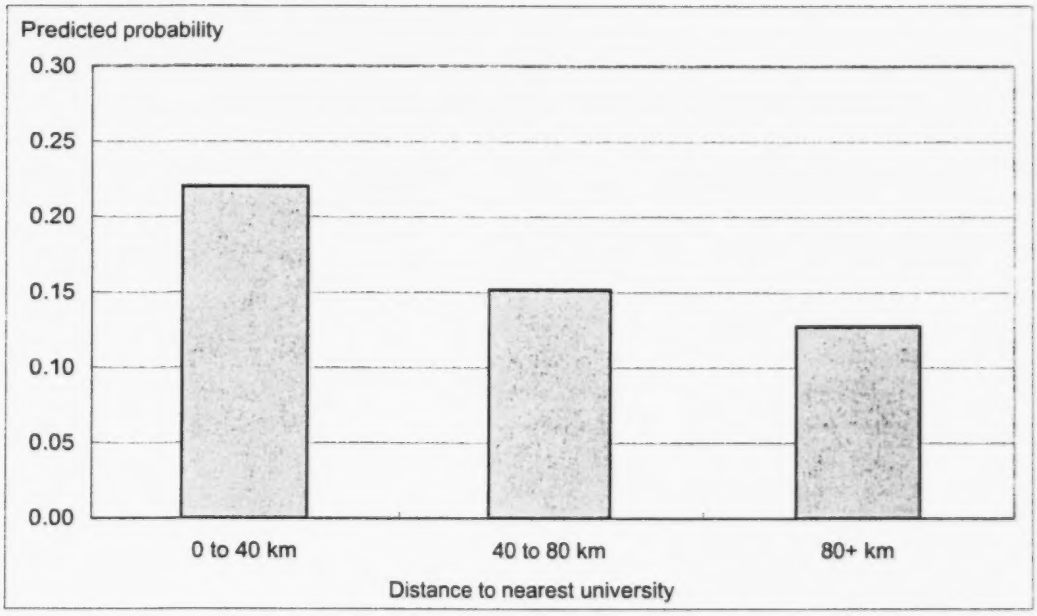
Whether or not local attendance *actually* improves as a result of a local university is a question that I will attempt to answer in the remainder of the study. I do so by examining university attendance patterns among youth who grew up in areas where either new universities were physically built or colleges were given degree-granting status. After providing a brief history of the creation of degree-granting institutions in Canada, I move on to the main results. The descriptive evidence demonstrates that following the creation of a new degree-granting institution, university attendance among local youth in each community affected by the change increased more than in other parts of the country. The difference was almost always quite substantial. The econometric results suggest that the creation of a local degree-granting institution is associated with a 28.1% increase in university attendance among local youth. However, the increase in university participation came at the expense of college participation. Furthermore, not everyone benefited equally from new universities. In particular, students from lower-income families saw the largest increase in university participation, which is consistent with the notion that distance poses a financial barrier. Also, local Aboriginal youth only saw a slight increase in university participation when faced with a local university option. Finally, the presence of a local university is associated with a 9.5% increase in earnings among recent female postsecondary graduates; however, it is not associated with a change in earnings among recent male postsecondary graduates.

2. *Distance to school and postsecondary participation: What we know*

Although the literature is somewhat scant, all studies investigating the relationship between distance to school and university participation have found a negative link. In the United States, Card (1995) found that students who grew up in an area served by a local college had one additional year of schooling compared to other students, on average. Do (2004) found that the quality of the local college had a positive impact on the quality of the college attended by low-income students, including those who did not attend the local college. The interpretation is that colleges have positive spill-over effects on students by providing information about postsecondary education and positive role models for youth.

In Canada, Andres and Looker (2001) tracked high school students from the late 1980s in Nova Scotia and British Columbia, and found that distance to school is negatively correlated with the probability of eventually attending university. Frenette (2006) examined the issue at the national level while controlling for sex, family income, parental education, provincial fixed effects, and period effects. The predicted probabilities of attending university shortly after high school from this study are shown below in Figure 1 for three groups of students: those living within 40 kilometres of a university, from 40 to 80 kilometres from a university, and beyond 80 kilometres from a university.

Figure 1 Predicted probability of university participation shortly after high school by distance to nearest university



Source: Statistics Canada, Survey of Labour and Income Dynamics.

Students who grew up within 40 kilometres of a university are 73% more likely to attend university than students who grew up beyond 80 kilometres, and 45% more likely to attend than students who grew up from 40 to 80 kilometres from a university. The study also found that students from lower-income families were the most negatively affected by distance. This may suggest that distance deters some students from attending university for financial reasons (i.e., the cost of moving away). The study also noted that distance to university should not be confounded with the urban/rural status of one's community. Many urban areas are not served by a university, while several rural areas are actually quite close to an urban area that houses a university.

In a related study, Frenette (2004) notes that although distance to school acts as a deterrent to university attendance, most students are at least served by a local college. Students who grew up in an area that is far away from a university are less likely to attend university, but more likely to attend college. Whether this is their first choice or not is unclear, but in the end, *overall* postsecondary participation rates do not vary by distance to university.

3. Methodology

The ultimate goal of this study is to assess the impact of local universities on university attendance among local youth. As a first step, I demonstrate that differences in academic achievement are not a likely reason for the gap in university attendance that exists between students who grew up near a university and those who grew up far from a university.

The data used for this exercise are drawn from the 2000 Youth in Transition Survey (YITS) reading cohort, which was collected as part of the Programme for International Student Assessment (PISA). The target population consists of 15-year-old students enrolled in an educational institution in Canada on December 31, 1999.[2] Students living in the territories or on Indian reserves, students who were deemed mentally or physically unable to perform in the PISA assessment, and non-native speakers with less than one year of instruction in the language of assessment were excluded.

The PISA assessment consisted of standardized tests in the areas of reading, mathematics, and science. All students were assessed in reading, while only about half were assessed in mathematics and science (based on a random sub-sample of PISA students within schools). The reading test focused on retrieving information, interpreting, and reflecting. Students were assessed in the language of instruction of the school for all three tests, which was either English or French.

Distance to the nearest university was calculated by converting the 6-digit postal codes of the schools attended by the 15-year-olds and those of universities into geographic co-ordinates (latitude and longitude) with the help of the Postal Code Conversion File Plus (PCCF+).[3] In total, 71 degree-granting institutions of general interest were included (i.e., non-theological, non-military, and broad-

2. The survey design consisted of a two-stage approach. In the first stage, a stratified sample of schools was selected to ensure adequate coverage in all 10 Canadian provinces (including adequate coverage of minority school systems in certain provinces). The stratification was based on the enrolment of 15-year-olds in the school in the previous academic year. In the second stage, a simple random sample of 15-year-old students within the school was selected.

3. See Frenette (2006) for more details on the Postal Code Conversion File Plus.

based in terms of degree options).[4] With the geographic co-ordinates of students and universities in hand, spherical geometry can be used to calculate the straight-line distance between each student–university pair. As was done in Frenette (2006), three distance categories are used: 0 to 40 kilometres (within commuting distance), 40 to 80 kilometres (possibly out of commuting distance, depending on whether the student has access to a car, class schedules, the precise nature of the geography separating the student's home and the university, etc.), and 80 kilometres or more (out of commuting distance).

After demonstrating that the relationship between distance to the nearest university and academic achievement is weak, I move on to assessing the impact of a local university on university and college attendance among local youth, as well as on the earnings of recent postsecondary graduates. To this end, I turn to the quinquennial Census of Population microdata files for the years 1981 to 2001. These files contain detailed socioeconomic information on 20% of Canadian households.

The main outcome of interest relates to the postsecondary participation patterns of these individuals. In the census, respondents are asked about the number of years completed at a university and at an institution other than a university (i.e., a 'college'), a secondary school, or an elementary school. Thus, a 'college' refers to any form of non-university postsecondary institution in this study. In most cases, these refer to Colleges of Applied Arts and Technology (CAAT) in Ontario, *collèges d'enseignement général et professionel* (CEGEPs) in Quebec, and 'community colleges' in many other parts of the country. However, other postsecondary institutions are also included, such as technical institutes, private trade schools or private business colleges, diploma schools of nursing, etc.

In this study, individuals are considered to have attended university (college) if they have completed at least one full year of university (college) credits. If they attended both university and college, they are considered to have attended 'university.' This situation is far more common in Quebec since the completion of CEGEP is required in order to attend university in that province. Note that the census data do not include the location where students attended school.

The primary explanatory variable used in this study relates to the presence of a local university. In creating this variable, it is imperative to identify the presence of a university in the area where the individual was situated when decisions about postsecondary education had to be made. In the census, there is detailed information on the area of residence (the census metropolitan area/census agglomeration, or CMA/CA) of individuals 5 years ago, when the individuals in this study were 15 to 19 years old. It is this information that is used to create the local university indicator variable. More specifically, the CMA/CA of individuals 5 years ago is matched annually to a list of CMA/CAs that are served or not by a degree-granting institution.[5] In order to avoid low sample sizes, only individuals living in a CMA/CA with a population of 25,000 or more in all census years from 1981 to 2001 were selected for the study. This corresponds to 74 out of approximately 125 original CMA/CAs originally (depending on the year).

4. This database corresponds to the one used in Frenette (2006) and is available upon request.

5. This list was created from various sources, including the website of the Association of Universities and Colleges of Canada (http://www.aucc.ca), as well as various websites of universities and university colleges.

To assess the impact of a local university on university and college participation, I estimate the following multinomial logit model on a pooled sample of youth (20 to 24 years old):

$$ln\left(\frac{P_{ijk,t}}{P_{ij0,t}}\right) = \alpha_{0k} + \alpha_{1k} LOCAL_{j,t-5} + \alpha_{2k} INDIV_i + \alpha_{3k} CMACA_{j,t-5} + \theta_{k,t} + Z_j + \varepsilon_{ijk,t}.$$

The natural logarithm of the odds ratio of individual i who grew up in city j making choice k (1=college; 2=university) in period t relative to making choice 0 (no postsecondary schooling) is a linear function of the following variables and an error term (ε):

- A dummy variable indicating the presence of a local university five years earlier, when the individual was living in CMA/CA j and was 15 to 19 years old (LOCAL);
- Individual characteristics that are fixed over time, including female and Aboriginal[6] dummy variables (INDIV);
- Characteristics of the CMA/CA five years earlier, including mean economic family income, the proportion of adults who were 40 years old or more who hold a university degree, and the unemployment rate among those 15 to 24 years old (CMACA);
- Year dummy variables to capture period effects (θ);
- A vector of dummy variables to account for CMA/CA fixed effects from five years ago (Z).

Note that since there was no census in 1976, information on the CMA/CA five years ago is unavailable for the analysis of local youths' university attendance in 1981. Therefore, the regressions will focus exclusively on university attendance for the census years 1986 to 2001. In the descriptive analysis, all census years from 1981 to 2001 will be considered.

In a separate analysis, I attempt to examine the relationship between university participation following the creation of a new university for different income groups. However, not all 20- to 24-year-olds live with their parents. Therefore, I had to drop individuals who did not live with at least one parent, which consists of 49% of all cases. Nevertheless, this measure did not introduce a bias in the relationship between family income and university participation. To prove this, I had to turn to a longitudinal data source, namely the Survey of Labour and Income Dynamics (SLID). I began by selecting individuals who were 15 to 19 years old in 1996, and thus, 20 to 24 years old in 2001. I then generated university participation rates for five family income categories, using the income of the individual's economic family in 1996. Finally, I regenerated the university participation rates using the same income measure, but after dropping individuals who no longer lived with a parent in 2001. The results suggest that no substantial bias results from conditioning on individuals who still live with a parent (Table 1).

6. Respondents were asked, "To which ethnic or cultural group(s) did this person's ancestors belong?" and to specify as many groups as applicable. The following responses were coded as 'Aboriginal': 'North American Indian,' 'Métis' and 'Inuit.'

Table 1 University participation rates by economic family income, 2001

1996 economic family income (in 2000 constant dollars)	All 20- to 24-year-olds	All 20- to 24-year-olds living with at least one parent in 2001
<25,000	0.2198	0.2636
25,000 to <50,000	0.2824	0.3584
50,000 to <75,000	0.3203	0.3375
75,000 to <100,000	0.4141	0.4540
>=100,000	0.5660	0.5750

Source: Statistics Canada, Survey of Labour and Income Dynamics.

To assess the impact of local universities on earnings, I estimate the following ordinary least squares regression on the sub-sample of postsecondary graduates with positive paid earnings and zero net self-employment income:

$$ln(PDEARN_{ij,t}) = \beta_0 + \beta_1 LOCAL_{j,t-5} + \beta_2 INDIV_i + \lambda_t + W_j + \mu_{ij,t}.$$

The natural logarithm of paid earnings (PDEARN) of individual *i* who grew up in city *j* in period *t* is a linear function of the local university indicator and individual characteristics, such as years of potential experience (and its square)[7], and an Aboriginal dummy variable. Year (λ) and city (W) fixed effects are added as before.

The mean sample characteristics by the presence of a local university appear below in Table 2. In cities served by a local university (representing 87% to 89% of all individuals in the sample), university participation rates are higher, while college participation rates are lower. We also tend to find fewer Aboriginal youth, families with higher incomes, more highly educated adults, and lower youth unemployment rates than in cities not served by a local university. Given the magnitude of these differences, and the possibility that these variables may be strong determinants in decisions about postsecondary schooling, it is imperative to take these variables into account when making comparisons of educational outcomes by the presence of a local university. The sample size appears at the bottom of the table. Note that the table also shows the number of observations when restricting the sample to youth living with at least one parent, and when only postsecondary graduates are selected.

7. Years of potential experience = age – years of schooling – 5. For university graduates, years of schooling is set at 17 for youth who grew up in Ontario and 16 otherwise. For college graduates, years of schooling is set at 14.

Table 2 Mean sample characteristics by presence of a local university

	1986	1991	1996	2001
Proportion near a local university	0.8661	0.8800	0.8903	0.8907
Local university present				
Attended university	0.2524	0.3079	0.3455	0.3593
Attended college, but not university	0.2317	0.2435	0.2570	0.2690
Female	0.5009	0.5008	0.4996	0.4947
Aboriginal	0.0065	0.0104	0.0089	0.0093
Family income<25,000	0.0753	0.0602	0.0900	0.0727
25,000<=Family income<50,000	0.1640	0.1415	0.1681	0.1418
50,000<=Family income<75,000	0.2414	0.2184	0.2240	0.2032
75,000<=Family income<100,000	0.2246	0.2210	0.2108	0.2082
Family income>=100,000	0.2948	0.3589	0.3071	0.3742
Mean local family income	70,936	67,494	72,029	67,063
Proportion of local adults 40+ with university degree	0.0787	0.1005	0.1293	0.1546
Youth local unemployment rate, 15 to 24 years of age	0.1191	0.1538	0.1479	0.1710
Sample size	258,192	217,203	226,242	224,896
Sample size (living with at least one parent)	132,003	120,936	131,763	139,486
Sample size (postsecondary graduates)	92,177	103,635	86,695	90,539
No local university present				
Attended university	0.1834	0.2391	0.2769	0.2569
Attended college, but not university	0.2539	0.2715	0.3042	0.3361
Female	0.5050	0.5038	0.5005	0.4972
Aboriginal	0.0110	0.0146	0.0119	0.0130
Family income<25,000	0.0930	0.0765	0.0882	0.0683
25,000<=Family income<50,000	0.2109	0.1795	0.1741	0.1471
50,000<=Family income<75,000	0.2834	0.2427	0.2509	0.2401
75,000<=Family income<100,000	0.2116	0.2329	0.2249	0.2274
Family income>=100,000	0.2011	0.2684	0.2619	0.3171
Mean local family income	65,936	61,867	68,415	58,188
Proportion of local adults 40+ with university degree	0.0428	0.0560	0.0721	0.0845
Youth local unemployment rate, 15 to 24 years of age	0.1579	0.2045	0.1693	0.2009
Sample	40,823	30,263	28,227	28,445
Sample size (living with at least one parent)	17,382	14,104	14,055	14,508
Sample size (postsecondary graduates)	14,038	13,824	10,764	11,403

Notes: The samples include 20- to 24-year-old individuals in the years 1986, 1991, 1996 and 2001 who, 5 years earlier, lived in a census metropolitan area/census agglomeration with a population of 25,000 or more (in all census years from 1981 to 2001).
For the family income categorical variables, individuals no longer living with a parent were dropped.
'Family income' refers to economic family income in 2000 constant dollars.

Source: Statistics Canada, Census of Population.

4. Distance to the nearest university and academic achievement

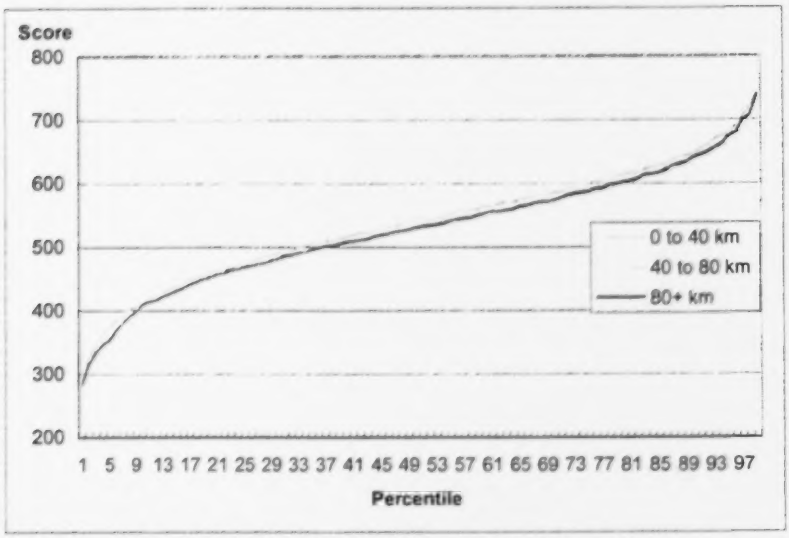
In this section, I explore the relationship between distance to the nearest university and academic achievement. In Figure 2, reading scores are shown for each distance category. Throughout most of the distribution, students who are situated within 40 kilometres of a university score approximately 2% higher on the reading test than other students. This is slightly lower than the gap between urban and rural students found by Cartwright and Allen (2003). This is because not all urban students have access to a local university, while some rural students are close enough to an urban area to commute to a university (Frenette, 2006).

It would be very difficult to argue that a 2% gap in reading achievement can explain the large gaps in university participation shown in Figure 1. Recall that students who grew up within 40 kilometres of a university are 73% more likely to attend university than students who grew up beyond 80 kilometres and 45% more likely to attend than students who grew up from 40 to 80 kilometres from a university. Furthermore, the gap tends to be smaller at the top of the distribution, where most university-bound students are likely to be found.

Of course, reading is not the only component of academic achievement. Fortunately, the YITS-PISA (Youth in Transition Survey/Programme for international Student Assessment) data also contain test scores in mathematics and science. The difference in mathematics achievement across the distance categories largely mirrors those found in reading scores: a 2% gap for most of the distribution (Figure 3). With regards to science abilities, the test scores are even more similar (Figure 4).

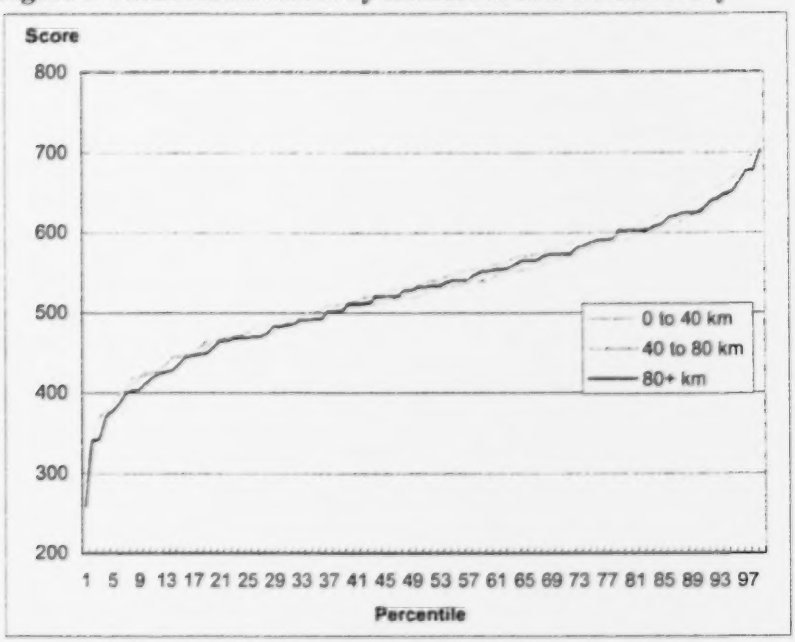
In summary, the relationship between academic achievement and distance to the nearest university is modest at best. It certainly could not go very far in explaining the relationship between distance to school and university attendance. Furthermore, the university attendance patterns shown in Figure 1 account for differences in family income and parental education. Taken as a whole, this means that students who grew up far away from a university are less likely to attend for reasons other than parental finances, role modelling effects (through parental education), and academic achievement. As discussed in the introduction, the annual cost of moving away to attend stands at about $5,400, and is perhaps a more plausible reason for the observed negative relationship between distance from school and university participation.

Figure 2 Reading scores by distance to nearest university



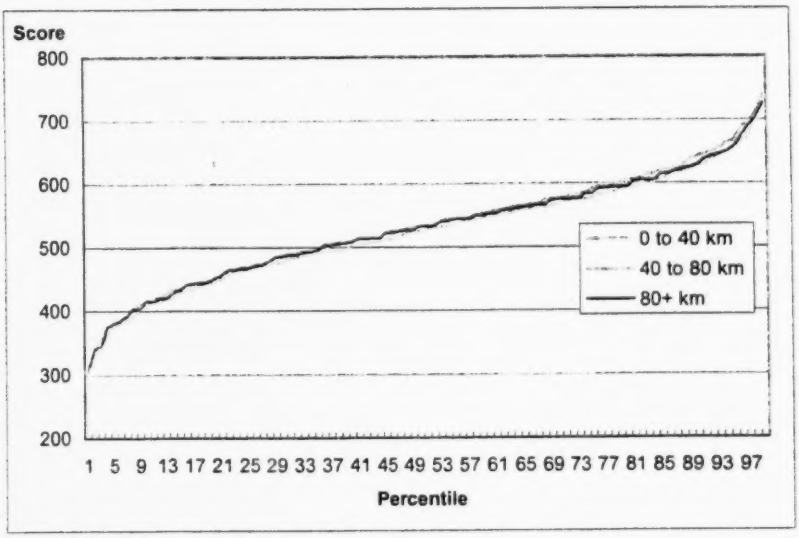
Note: The sample consists of a 15-year-old cohort in 2000.
Source: Statistics Canada, Youth in Transition Survey and Programme for International Student Assessment.

Figure 3 Mathematics scores by distance to nearest university



Note: The sample consists of a 15-year-old cohort in 2000.
Source: Statistics Canada, Youth in Transition Survey and Programme for International Student Assessment.

Figure 4 Science scores by distance to nearest university



Note: The sample consists of a 15-year-old cohort in 2000.
Source: Statistics Canada, Youth in Transition Survey and Programme for International Student Assessment.

5. A brief history of new universities in Canada, 1981 to 2001

Traditionally, the Canadian postsecondary education system could be easily divided into colleges and universities: the former offered certificates, while the latter offered degrees. In more recent years, the line has been blurred somewhat by the creation of university colleges, which are former colleges that have received degree-granting status. The increasing prevalence of university colleges, in addition to the creation of a brand new university and a new satellite campus of an existing university, represents the main sources of variation in the presence of a local university used in this study.

Most instances of newly created degree-granting institutions can be found in British Columbia.[8] Prior to 1989, all universities in British Columbia were located in the southern part of Vancouver Island (University of Victoria) or in the Lower Mainland (University of British Columbia and Simon Fraser University). No other universities could be found outside of this relatively small area of the province. Although students could pursue university transfer credits in local colleges, the completion of a university degree required one to move to this relatively small part of the province. Eventually, demand for university services in other parts of the provinces led to political pressures from students, parents, and politicians. The *Access for All* report (Provincial Access Committee, 1988) was released, which led to policies regarding increased access to university in other parts of the province.

8. The following discussion draws heavily from Dennison and Schuetze (2004).

In 1989, the Government of British Columbia announced that several colleges would be transformed into university colleges. In that same year, Cariboo College in Kamloops (renamed University College of the Cariboo), as well as Okanagan College in Kelowna (renamed Okanagan University College) began granting degrees. Malaspina College in Nanaimo on Vancouver Island also became a university college in that year (it was renamed Malaspina University-College), but it only received degree-granting status in 1995. Fraser Valley College received degree-granting status in 1992 and was renamed the University College of the Fraser Valley, with main campuses in Abbotsford and Chilliwack. Only the Chiliwack campus is examined here, however, since Abbotsford only appears as a separate CMA/CA (census metropolitan area/census agglomeration) beginning in the 1986 Census and is arguably within commuting distance to Vancouver, which is served by the University of British Columbia and Simon Fraser University (in nearby Burnaby).[9] Kwantlen University College was also created following the *Access for All* report. However, it has campuses in the Lower Mainland near Vancouver, and only offers applied degrees. As such, it will not be examined in this study.

Perhaps the purest example of a newly created degree-granting institution is the University of Northern British Columbia (UNBC) in Prince George. Although they lived in a city of about 85,000 residents, students growing up in Prince George prior to 1994 had no option for pursuing a university degree while remaining in their community. In order to meet this potential demand, UNBC opened its doors in 1994 to students seeking a wide variety of university degrees.

Issues regarding local access to university are not unique to British Columbia. In order to address geographic discrepancies, students in Atlantic Canada have gained two new options in their university choice set since the early 1980s. First, Cape Breton College received degree-granting status in 1982, which led to the creation of the University College of Cape Breton in Sydney, Nova Scotia in that year. This brought local students up to par for the province with respect to local university access since students living in the main part of Nova Scotia already had access to several small universities scattered around the area, as well as a larger university in Halifax (Dalhousie University).

The second new option made available to students in Atlantic Canada was in the form of a satellite campus of the Memorial University of Newfoundland (MUN). In 1992, Sir Wilfred Grenfell College in Corner Brook, Newfoundland and Labrador, began granting university degrees on behalf of MUN.

6. Results

Descriptive results

I begin with some descriptive evidence of the impact of local universities on the university attendance of local youth. In Figures 5 to 11, university and college participation rates in the seven communities affected by the creation of new degree-granting institutions are shown. Benchmark

9. Based on the online distance calculator provided by the Government of British Columbia, it takes 52 minutes (72 kilometres) to travel one-way from Abbotsford to Vancouver (visit http://www.th.gov.bc.ca/popular-topics/distances/calculator.asp for more details).

participation rates are shown for communities which were served or not by a local university in all census years.

We begin with Figures 5a to 11a (university participation), appearing on the left-hand side. The five communities in British Columbia that were affected by the creation of new degree-granting institutions saw large increases in university participation among local youth as the changes took place. Prince George, Kamloops, and Kelowna stand out in this regard. Following the creation of University of Northern British Columbia (UNBC) in 1994, the university participation rate among youth who grew up in Prince George jumped suddenly from 18.5% in 1996 to 26.8% in 2001 (Figure 5a). In contrast to the situation in Prince George, Canadian communities that did not house a university over the entire period (1981 to 2001) actually saw their youth participation rate decline from 27.7% in 1996 to 25.7% in 2001.

Youth who grew up in Kamloops saw a massive increase in their university participation rate shortly after Cariboo College received degree-granting status in 1989. From 1991 to 1996, the participation rate among youth in Kamloops jumped from 20.6% to 36.0% (Figure 6a). Kelowna also acquired local access to a university in 1989, and its participation rate rose from 22.7% to 31.2% from 1991 to 1996 (Figure 7a).

Pursuing a degree in Chilliwack became a possibility in 1992. However, the main purpose of the Chilliwack campus was to meet excess demand for specific courses that could not be met by the main Abbotsford campus of the University College of the Fraser Valley.[10] Nevertheless, the local youth university attendance rate rose from 20.1% in 1996 to 24.4% in 2001 (Figure 8a). Residents of Nanaimo could pursue a university degree in their hometown starting in 1995. From 1996 to 2001, the university participation rate among local youth jumped from 27.4% to 33.7% (Figure 9a). Again, more moderate increases such as these should not be discounted since participation rates fell in Canadian communities that did not house a university at the time.

In Corner Brook, Newfoundland and Labrador, local residents acquired local access in 1992. From 1991 to 1996, the university participation rate rose from 30.6% to 43.8% among youth who grew up in Corner Brook (Figure 10a). The gains in other parts of the country were far more modest during the same period.

Students in Sydney, Nova Scotia, first acquired local access to a university in 1982. Since the data are not available prior to 1981, it is very difficult to draw strong conclusions by simply observing trends following this event. Although the university participation rate grew at a faster pace from 1981 to 1986 in Sydney than in other communities, the difference is very modest (Figure 11a).

The increase in the university participation rates in the five affected communities in British Columbia is important in light of the fact that university transfer programs were already well-established in the college system; however, youth who grew up in those areas were less likely to go on to university than youth who grew up in other Canadian communities that did not house a university (with the exception of Kamloops). After the changes, the participation rates in Kamloops, Kelowna, and Nanaimo moved up to par with Canadian communities that already housed a

10. Thanks to Dale Box of the University College of the Fraser Valley for providing this information.

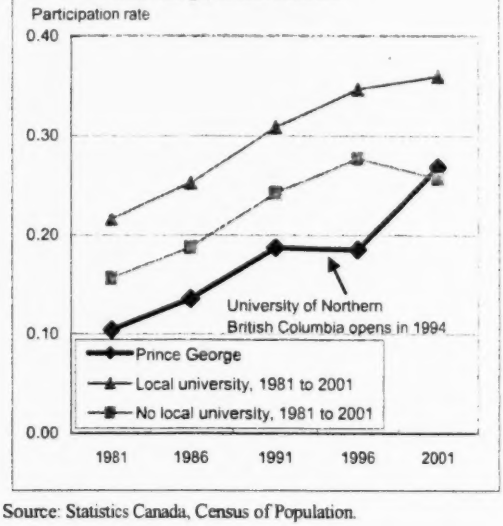
university. In Prince George and Chiliwack, participation rates rose up to par with Canadian communities that did not house a university.

The story is very different in Atlantic Canada. In the two affected communities, university participation rates were already up to par with Canadian communities that already housed a university. Since the creation of new degree-granting institutions, university participation rates in Corner Brook and Sydney have risen beyond the rates in Canadian communities that already housed a university.

The increases in university participation came at the expense of college participation in most of these communities (Figures 5b to 11b, appearing on the right). For example, the college participation rate in Kelowna, British Columbia, declined from 25.8% in 1991 to 17.8% in 1996 (Figure 7b). Other cities saw similar declines, with the exception of Corner Brook.

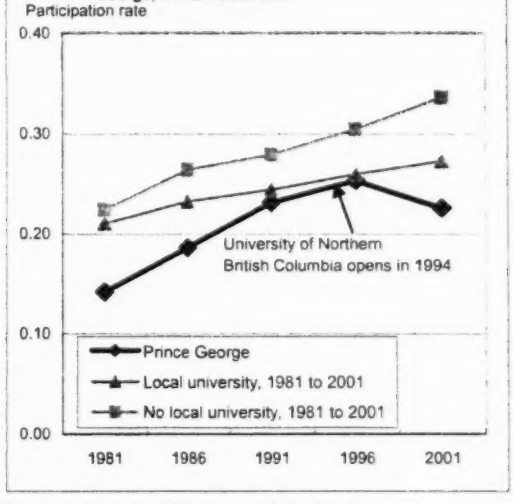
Thus, there was very little change in overall postsecondary participation rates in the affected communities. Instead, we observed a *switch* from college to university for a large proportion of local youth. In other words, the expanding university sector may have 'crowded out' the college sector. Of course, in many instances, the switch may have occurred within the same institutions.

Figure 5a Youth university participation rate in Prince George, British Columbia



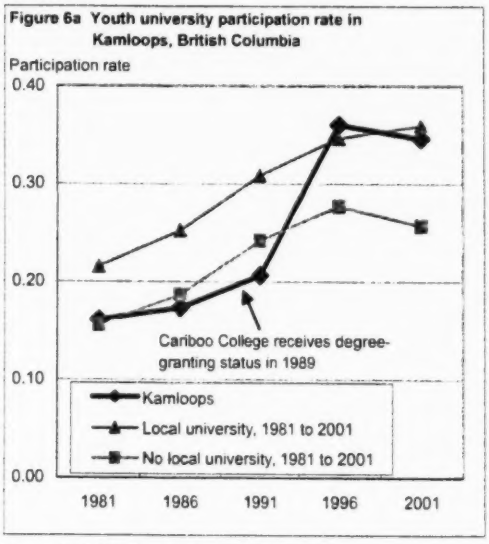
Source: Statistics Canada, Census of Population.

Figure 5b Youth college participation rate in Prince George, British Columbia



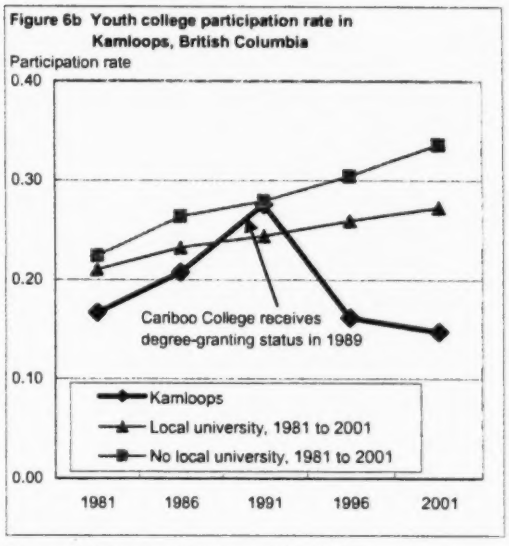
Source: Statistics Canada, Census of Population.

Figure 6a Youth university participation rate in Kamloops, British Columbia



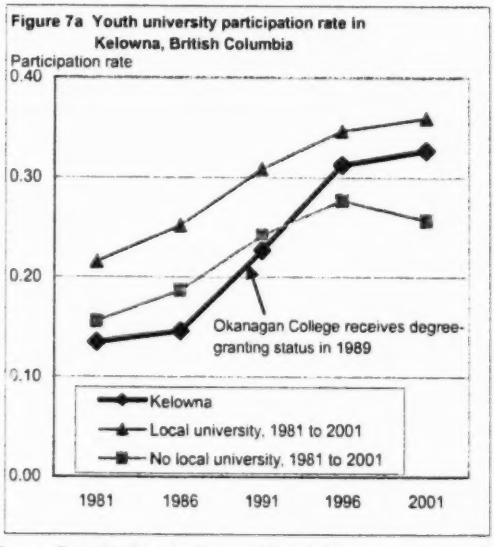
Source: Statistics Canada, Census of Population.

Figure 6b Youth college participation rate in Kamloops, British Columbia



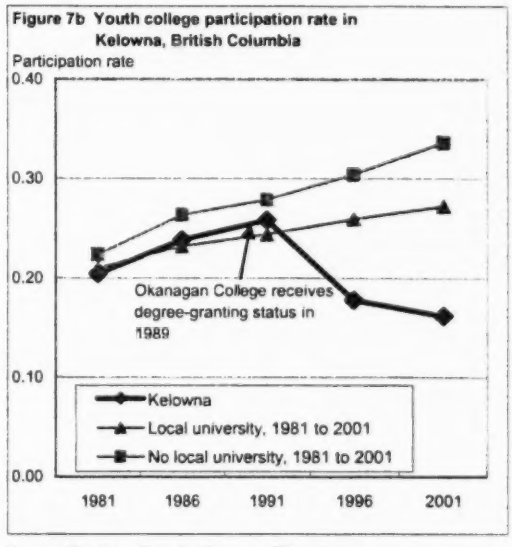
Source: Statistics Canada, Census of Population.

Figure 7a Youth university participation rate in Kelowna, British Columbia

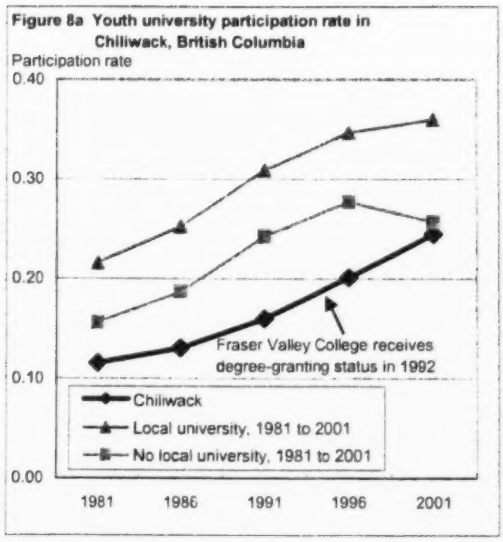


Source: Statistics Canada, Census of Population.

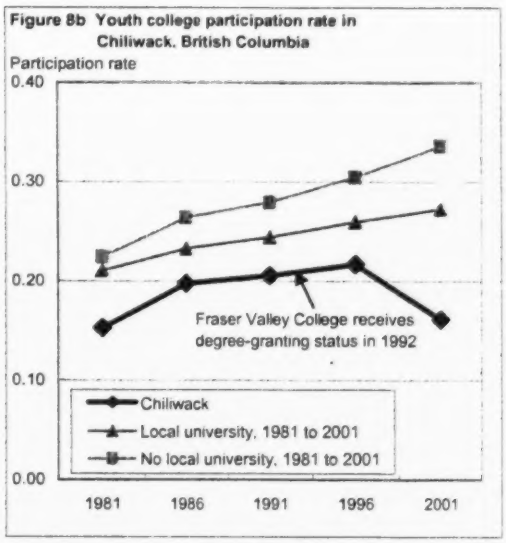
Figure 7b Youth college participation rate in Kelowna, British Columbia



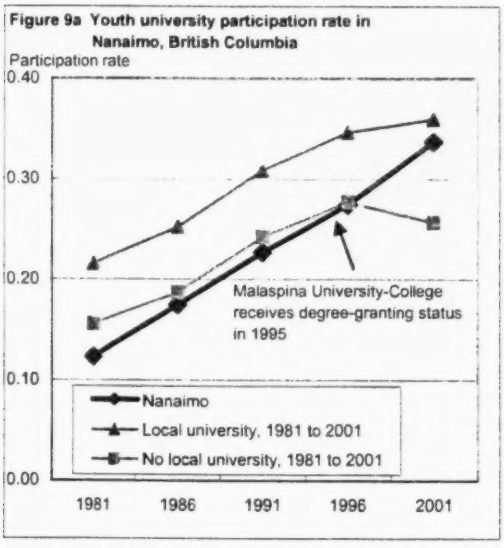
Source: Statistics Canada, Census of Population.



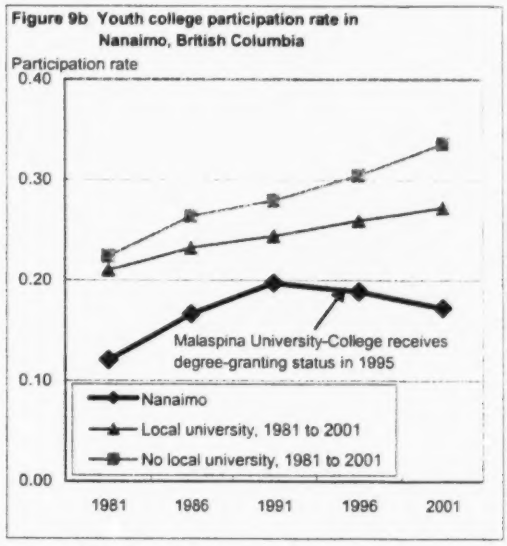
Source: Statistics Canada, Census of Population.



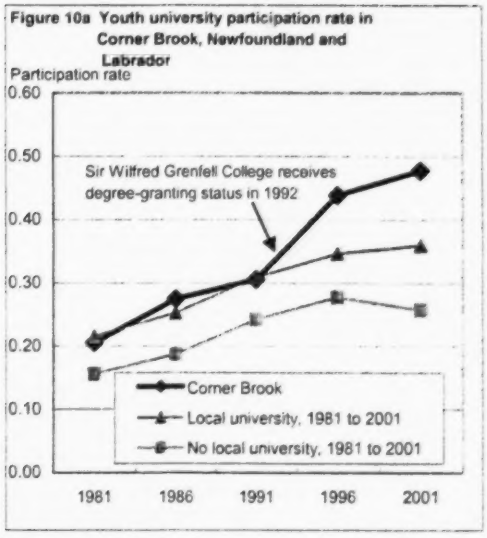
Source: Statistics Canada, Census of Population



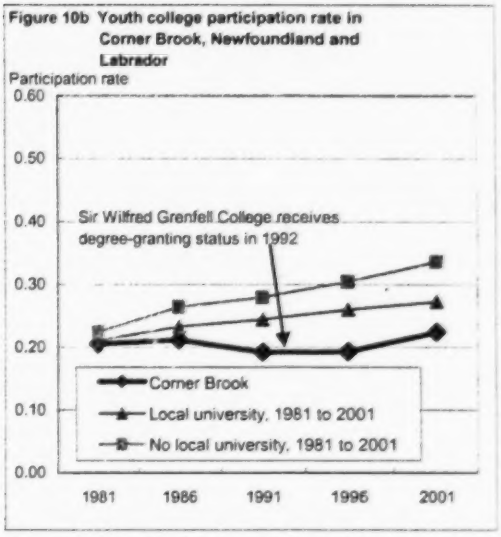
Source: Statistics Canada, Census of Population.



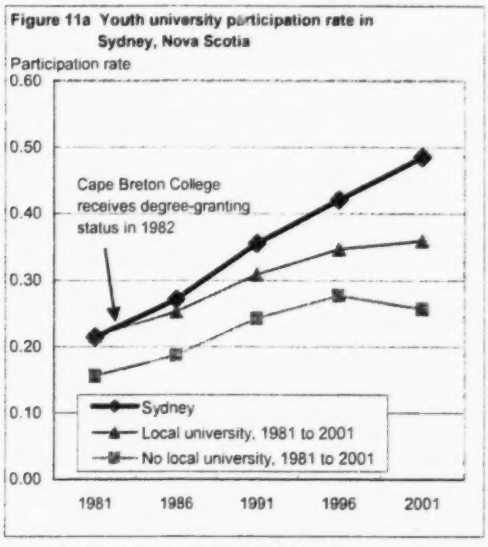
Source: Statistics Canada, Census of Population.



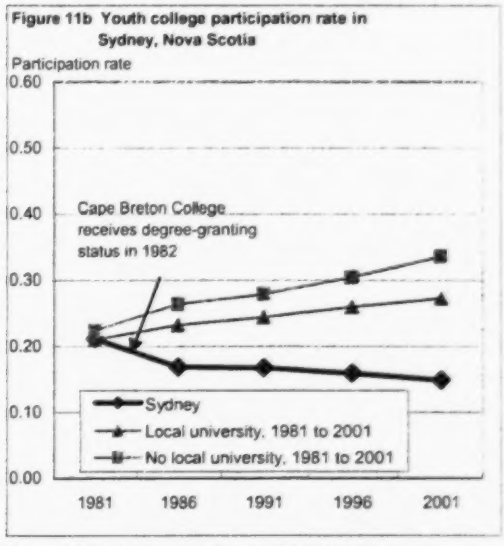
Source: Statistics Canada, Census of Population.



Source: Statistics Canada, Census of Population.



Source: Statistics Canada, Census of Population.



Source: Statistics Canada, Census of Population.

Econometric results

In this section, I summarize the relationship between new degree-granting institutions and local youth participation rates in a simple econometric framework, as described in the Methodology section. Following this, I apply a similar approach to examine the relationship between the presence of a local university and the earnings of recent postsecondary graduates.

The results from three participation models appear in Table 3. In Model 1, no interaction terms were used. The results suggest that the creation of a local university is associated with an increase in university participation and a decrease in college participation relative to no postsecondary participation, which are both statistically significant at 1%. Most of the remaining coefficients are statistically significant and have the expected sign.[11]

Table 3 Multinomial logit model results — University and college participation[1,2]

	Model 1 No interactions[3]				Model 2 Female and Aboriginal interactions[3]				Model 3 Family income interactions[4]			
	University		College		University		College		University		College	
	b	t	b	t	b	t	b	t	b	t	b	t
Local university	0.275	5.08	-0.198	-2.65	0.286	4.76	-0.177	-2.32	0.621	5.78	-0.176	-1.84
Female	0.342	11.04	0.266	15.75	0.358	13.05	0.298	16.06	0.892	26.94	0.592	22.75
Aboriginal	-1.891	-29.95	-0.872	-18.67	-1.654	-12.22	-0.808	-8.62	-1.508	-7.98	-0.683	-5.12
Local university*Female	...	...	...	...	-0.017	-0.40	-0.038	-1.42	-0.173	-3.52	-0.121	-3.70
Local university*Aboriginal	...	...	...	...	-0.273	-1.80	-0.077	-0.71	-0.128	-0.60	-0.149	-0.96
25,000<=Family income<50,000	...	...	...	...	...	...	...	...	0.421	7.52	0.335	7.32
50,000<=Family income<75,000	...	...	...	...	...	...	...	...	0.775	13.53	0.529	11.91
75,000<=Family income<100,000	...	...	...	...	...	...	...	...	1.184	19.39	0.782	15.97
Family income>=100,000	...	...	...	...	...	...	...	...	1.733	26.97	0.897	19.75
Local university*25,000<=Family income<50,000	...	...	...	...	...	...	...	...	-0.161	-2.36	-0.039	-0.76
Local university*50,000<=Family income<75,000	...	...	...	...	...	...	...	...	-0.275	-3.52	-0.025	-0.48
Local university*75,000<=Family income<100,000	...	...	...	...	...	...	...	...	-0.442	-5.13	-0.110	-1.89
Local university*Family income>=100,000	...	...	...	...	...	...	...	...	-0.449	-4.50	-0.068	-1.14
Mean local family income*10^{-4}	0.000	1.81	0.000	-1.77	0.000	1.81	0.000	-1.77	...	...	...	...
Proportion of local adults 40+ with university degree	3.130	3.45	0.092	0.14	3.131	3.45	0.086	0.13	3.717	2.94	0.024	0.03
Youth local unemployment rate, 15 to 24 yrs. of age	0.366	1.25	-0.604	-2.16	0.366	1.25	-0.604	-2.17	0.373	0.91	-0.366	-1.07
Year=1991	0.278	8.32	0.226	7.68	0.278	8.33	0.226	7.68	0.191	4.88	0.168	4.40
Year=1996	0.408	6.85	0.434	11.87	0.408	6.85	0.435	11.85	0.358	5.27	0.410	9.45
Year=2001	0.446	6.22	0.542	11.08	0.446	6.22	0.543	11.06	0.198	2.09	0.429	7.18
Intercept	-1.705	-6.66	-0.440	-2.10	-1.715	-6.62	-0.458	-2.20	-2.284	-13.54	-1.278	-9.93
Log likelihood	-1,098,543				-1,098,536				-602,271			
Sample size	1,054,291				1,054,291				584,237			

... not applicable

1. The dependent variable has three possible values: 0=no full year of college or university; 1=at least one full year of college, but no full year of university; and 2=at least one full year of university.
2. The regressions include the census metropolitan area/census agglomeration (CMA/CA) fixed effects.
3. The sample includes 20- to 24-year-old individuals in the years 1986, 1991, 1996, and 2001 who, 5 years earlier, lived in a CMA/CA with a population of 25,000 or more (in all census years from 1981 to 2001).
4. The sample is identical to '3', except individuals no longer living with a parent were dropped.

Note: 'Family income' refers to economic family income in 2000 constant dollars.

Source: Statistics Canada, Census of Population.

11. Standard errors were calculated using the Huber-White-Sandwich robust estimator. The standard errors were further adjusted to account for the intra-group dependence of observations within clusters of CMA/CA and year.

To place the regression coefficients into context, the predicted university and college participation rates are shown in Figures 12a and 12b, respectively, under two scenarios: students have no access to a local university, and students have local access.[12] The creation of a new university is associated with a 28.1% increase in the university participation rate (Figure 12a).[13] However, it is also associated with a 19.3% decrease in college participation. Overall, postsecondary participation is estimated to increase by a modest 1.7% following the creation of a new university.

Has the creation of new universities benefited everyone equally? In Model 2, the female and Aboriginal variables are interacted with the local university indicator. The results suggest that the creation of a new degree-granting institution benefits males and females to the same extent in terms of university participation, and both see a similar decline in college participation (Table 3 and Figures 13a and 13b).

However, local Aboriginal youth benefit far less than non-Aboriginal youth from a local university. In fact, it is shown in Figure 14a that the predicted probability of university participation is about the same among Aboriginal youth whether a local university is present (9.1%) or not (8.5%), corresponding to a 6.8% increase. This finding is interesting in light of the fact that one of the main recommendations in the *Access for All* report was to "increase accessibility to post-secondary education for indigenous people (First Nations)" (Dennison and Schuetze, 2004).[14] In contrast, university participation is 27.7% higher for non-Aboriginal youth living in cities served by a university.

If distance poses a financial barrier to attending university, then we may expect that the creation of a new university tends to benefit students from disadvantaged backgrounds relatively more than others, as found by Frenette (2004 and 2006). This is, in fact, what is suggested by Model 3, which includes interaction terms between family income categorical variables and the local university indicator on a sample of youth still living with at least one parent. Recall from Table 1 that this restriction does not substantially distort the relationship between university participation and family income.

The results are more clearly demonstrated in Figure 15a. In relative and absolute terms, university participation rates increase more following the creation of a new university for lower-income families. This holds true as we move between any two levels of family income, with the exception of the top two categories, which see about the same absolute increase in university participation rates (but the highest income group sees a smaller relative increase).

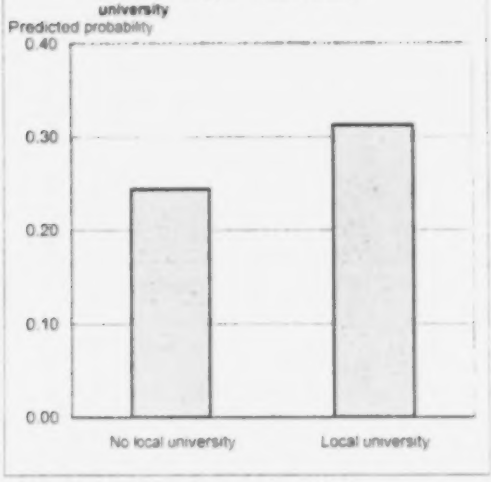
---

12. Predicted probabilities were calculated for each individual in the sample under the hypothetical scenario that all respondents had local access or not to a university and then averaged over the entire sample.

13. The estimates in Figure 12a are not directly comparable to those in Figure 1 for at least two reasons. First, individuals 20 to 24 years of age appear in Figure 12a, while Figure 1 referred to individuals who were eligible to enter their first year of university based on their province of residence. As a result, the participation rates are higher in Figure 12a. Second, some universities may be out of commuting distance for some students in the CMA, while some universities may be commutable for students living in a different CMA. In other words, the measurement error associated with using the CMA as a proxy for commutability tends to bias the gap in university participation across the two groups of students towards zero.

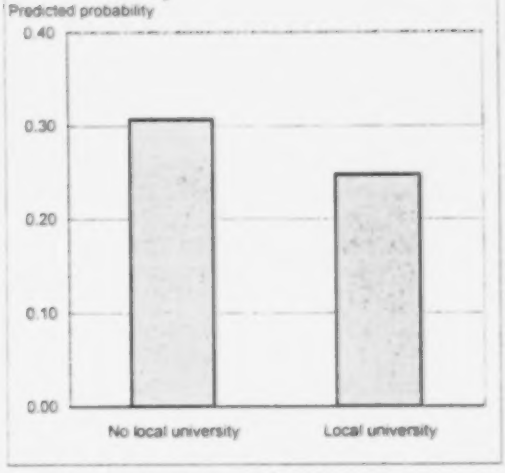
14. Of course, creating a local degree-granting institution is only one of perhaps many policy options available to increase accessibility to postsecondary education among the Aboriginal population.

Figure 12a Predicted probability of university participation by presence of a local university



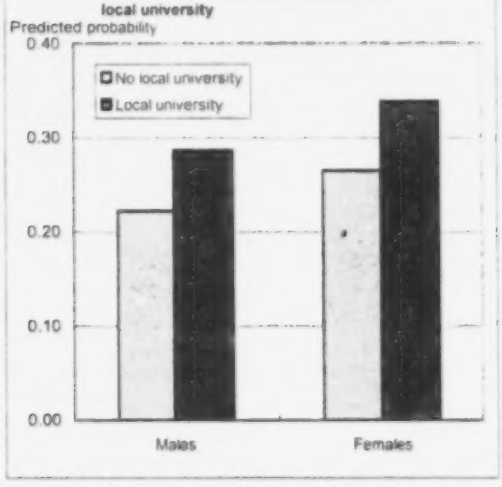
Source: Statistics Canada, Census of Population.

Figure 12b Predicted probability of college participation by presence of a local university



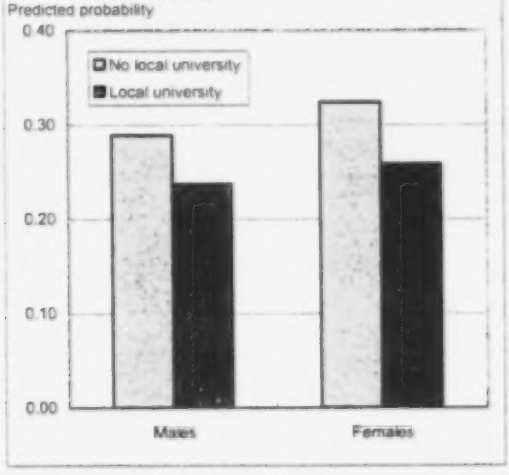
Source: Statistics Canada, Census of Population.

Figure 13a Predicted probability of university participation by sex and presence of a local university

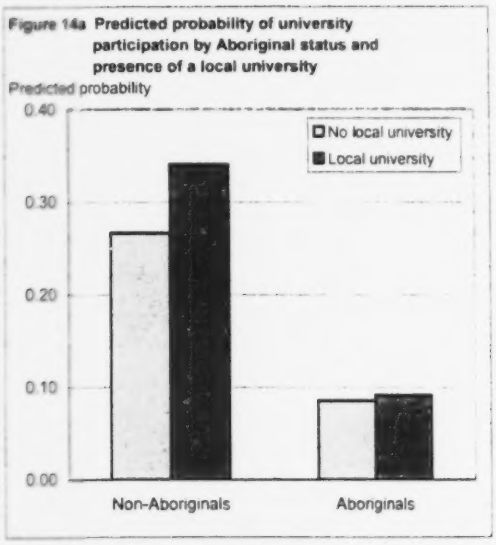


Source: Statistics Canada, Census of Population.

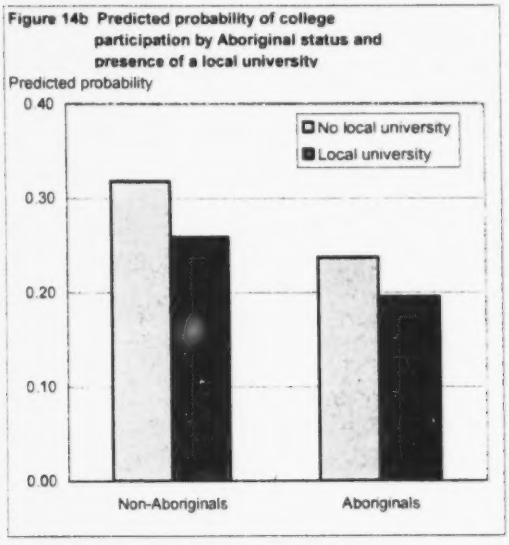
Figure 13b Predicted probability of college participation by sex and presence of a local university



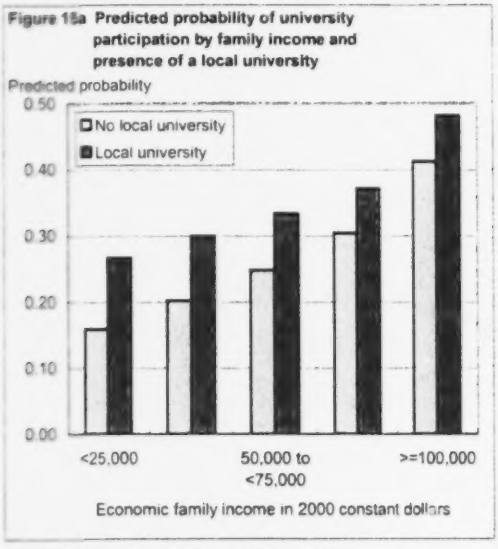
Source: Statistics Canada, Census of Population.



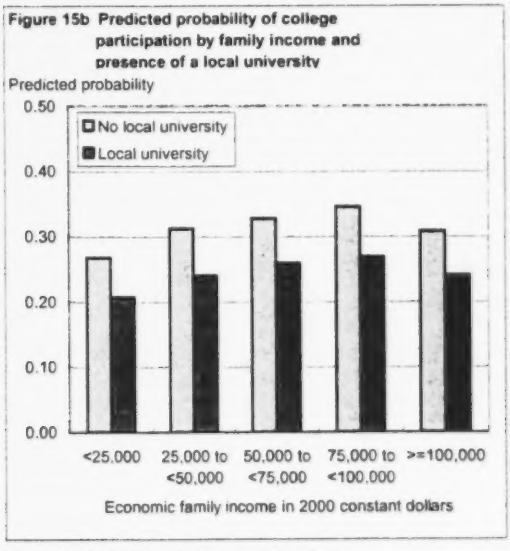
Source: Statistics Canada, Census of Population.



Source: Statistics Canada, Census of Population.



Source: Statistics Canada, Census of Population.



Source: Statistics Canada, Census of Population.

In Table 4, the results from the earnings regression are shown. Recall that a new university is associated with a switch from college to university participation, resulting in very little change in overall postsecondary participation. This is true for both men and women. What the results in Table 4 suggest is that this general movement from college to university participation in cities that acquired a new university was associated with no change in earnings among men who graduated from a postsecondary institution, but with a sharp increase in earnings among women who graduated from a postsecondary institution. Earnings actually declined by an estimated 4.1% among men, but this result is not statistically significant. In contrast, a new university was associated with about a 9.5% increase in women's earnings, which is significant at 5%. These results are consistent

with previous work suggesting that the wage premium associated with a bachelor's degree relative to a college or trade diploma is higher among women than among men (e.g., Ferrer and Riddell, 2002).

Table 4 Ordinary least squares model results – Log earnings[1]

	Men		Women	
	b	t	b	t
Local university	-0.041	-0.83	0.095	2.00
Experience	0.188	40.98	0.195	37.60
Experience^2	0.001	0.90	-0.005	-4.07
Aboriginal	-0.306	-4.91	-0.320	-5.89
Year=1991	0.312	21.50	0.249	13.11
Year=1996	0.112	7.23	0.116	8.57
Year=2001	0.402	28.38	0.378	27.24
Intercept	9.310	180.47	9.140	181.95
Adjusted R^2	0.1186		0.1038	
Sample size	170,717		199,741	

1. The regressions include the census metropolitan area/census agglomeration (CMA/CA) fixed effects.

Note: The sample includes 20- to 24-year-old postsecondary graduates in the years 1986, 1991, 1996, and 2001 who, five years earlier, lived in a CMA/CA with a population of 25,000 or more (in all census years from 1981 to 2001).

Source: Statistics Canada, Census of Population.

7. Conclusion

Students who do not have access to a local university are far less likely to go on to university than students who grow up near a university. Bridging the distance gap may be possible by covering the additional costs to help distant students attend or by increasing capacity in outlying areas. This study is concerned with the capacity lever. Specifically, I attempt to assess the impact of creating a new university on university and college participation rates, as well as on graduate earnings among local youth.

The descriptive evidence demonstrates that university attendance among local youth in each community affected by the change increased far more than in other parts of the country. The econometric results suggest that the creation of a local degree-granting institution is associated with a 28.1% increase in university participation among local youth. However, the increase in university participation came at the expense of college participation in most cities. Furthermore, not everyone benefited equally from new universities. In particular, students from lower-income families saw the largest increase in university participation, which is consistent with the notion that distance poses a financial barrier. Also, local Aboriginal youth only saw a slight increase in university participation when faced with a local university option. Finally, the presence of a local university is associated with a 9.5% increase in earnings among recent female postsecondary graduates; however, it is not associated with a change in earnings among recent male postsecondary graduates.

The results have important implications for discussions surrounding university access in outlying areas. According to Frenette (2006), almost 1 in 5 Canadian students grows up living out of commuting distance from a university. In the United States, more people live in rural areas, and about one-half of students do not have access to a local public university (Do, 2004). The results in the current study suggest that these students may benefit substantially from increased capacity in outlying areas since they are given more choices for postsecondary studies, and they generally behave differently when they have access to more choices.

Of course, the decision to increase capacity in outlying areas may also critically depend on the cost of doing so. This study provides first evidence on the benefits side of the equation. Future work could investigate the marginal cost of providing additional spaces in university programs in outlying areas, or even take the next step of analyzing the decision to increase capacity in a cost-benefit framework. Another useful avenue would be to investigate the effectiveness of increased student aid (in the form of loans or grants) in increasing the probability that distant students will pursue university studies. As discussed in the introduction, however, student aid and increasing university infrastructure in outlying areas may have very different implications for regional differences in economic prosperity. Financial aid may entice distant students to permanently leave their hometown, while increasing infrastructure may have the opposite effect.

Finally, it is important to put the results into perspective. The creation of new degree-granting institutions in the seven communities examined in this study was associated with a substantial increase in participation rates among their local youth. However, one cannot automatically assume that this result would hold if university infrastructure were increased in any community.[15] The seven communities that formed the basis of the study may have been the beneficiaries of new degree-granting institutions because there were unmet needs in those areas. What this study does show, however, is that students tend to make different decisions about postsecondary studies when faced with more options, and that out-of-town students (possibly from larger cities) do not necessarily crowd out local students from the additional spaces made available in new universities.

15. Similarly, one cannot automatically assume that university participation rates among Aboriginal youth would not rise if a new university were created in another community.

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